ANAESTHESIA, DEDUCTIONS FROM ONE THOUSAND CASES.

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It is well in some things to follow the motto of the Sun Dial: "I record only the hours of sunshine," but in medicine if one is honest with himself and his profession he will also record the hours of darkness.

Within the past five years I have given over one thousand anaesthetics, and I am glad to say, that I cannot record one case that died as the result of anaesthesia alone. Unfortunately, however, I have had the sad experience of witnessing the death of two patients in my own practice and three in the practice of my colleagues.

Case A. Ether anaesthesia: A child six years of age suffering from diffuse septic peritonitis produced by a perforating appendicitis, was prepared for operation. His temperature was subnormal, abdomen tympanetic, respiration embarrassed, and his pulse had disappeared. He was placed upon the table in a moribund condition. His abdomen was opened, the apendix removed, and a thorough peritoneal toilet made. Soon after closure of the abdominal wound was begun his pupils dilated, he gave a few gasps, expelled a round worm from his mouth and died.

Case B. Ether anaesthesia: A white woman forty-five years of age had suffered from recurrent carcinoma of the right breast for several months. She was cachectic and her general condition very bad. An inter-scapulo-humeral amputation was attempted. Great difficulty was experienced in ligating the subclavian artery, she lost much blood, and after one hour of anaesthesia she died of shock. I am willing to assume the responsibility of these deaths, but do not think they should be credited against the anaesthetic.

It will probably not be irrevelent to mention three other cases which I have seen occurring in the practice of other men.

Case 1. Chloroform anaesthesia: A white male about forty-five years of age had suffered from gall stones for many years. Anaesthesia was begun and without previous warning the patient died suddenly while the abdominal incision was being made. The operation was completed post-mortem, and a gall-stone occupying the entire bladder was removed. Cardiac and respiratory paralysis occurred synchronously. A thoroughly competent anaesthetist was administering the anaesthetic, and we must record the death of this patient against chloroform.

Case 2. Ether anaesthesia: A young negress with a very large ovarian cyst was anaesthetized. Just as the operation was begun she began to do badly and was immediately placed in the Trendelenberg position. In my opinion this was exactly what should not have been done, for, I am sure, the pressure of the cyst, indirectly, upon the diaphragm prevented resuscitation. I do not think we can justly credit this death to the anaesthetic, but must, at least, place part of the burden upon the faulty technique of resuscitation.

Case 3. Nitrous Oxide Anaesthesia: A healthy white woman about thirty years of age was given nitrous oxide for the purpose of extracting a tooth, and died in the dental chair. I saw this patient immediately after death and cannot say what was the cause.

Actions of Anaesthetics: Wagner and Hans Myer have proven that all narcotics act by combining with the lechiten and cholesterine holding bodies of the lipoid cells in the brain producing changes which result in narcosis.

Post-anaesthetic effects of ether: Dacosta and Kaltyer have found that the erythrocytes are increased on an average of 146,360 per cm., and that the hemoglobin index was increased an average of eight per cent. The leucocytes averaged 4,586 more after anaesthesia than before. This apparent improvement of the blood is no doubt due to blood concentration from purgation, etc., in the preparation of the patient, for we find in a few days after anaesthesia that both the hemoglobin and blood corpuscles are less than normal.

Jacquet and Offergeld could find no histological changes in the kidneys, and John C. Munroe reports five hundred cases in which casts and albumen were not increased after ether narcosis. In a series of cases which I examined the only change noticed was an increase in the specific gravity of the urine, due to the excess of urates, phosphates, etc.

Holcher claims that bronchitis and pneumonia are not due to the ether, but to secretion inspired into the lungs. I do not believe ether to be an irritant when properly diluted with air, and base my assertion upon the fact that the open method of anaesthesia has practically abolished the coughing and struggling so frequently seen with the older methods.

Post anaesthetic effects of chloroform: Chloroform combines directly with the erythrocytes causing the death of a considerable number of them and a marked dimunition in the hemoglobin.

Unger, Strossman and Bevan have found fatty degeneration of the liver and kidneys, and claim casts and albumen are often found and persist for a long time.

Battier and Soulier claim there is a dimunition in the glycogen; and since glycogen is a destroyer of poisons the amount of toxic material in the urine is increased. This they say can be prevented by lavage and the administration of glycogen and napthol. These points should be thoroughly considered as chloroform has always been the anaesthetic of choice in obstetrics.

Frankel has shown that fatty degeneration and fragmentation of the heart muscle exists; and Ajello found hyalin degeneration of the blood vessels, and products of degeneration in the spleen.

Upon the respiratory system there is primarily a reflex irritation, but secondarily the effects are similar to those of ether, only less marked. This is probably due to the diminished secretion. It produces a degeneration of the mucous membranes, especially of the stomach.

Contra-indications to general anaesthesia: The contra-indications to any general anaesthetic excepting nitrous oxide, which produces no post-anaesthetic effects, may be summed up briefly as follows: Fatty degeneration of the viscera, severe kidney or bronchial diseases, Addison's disease, marked sepsis, enlargement of the thymus and lymphatic system in general and inanitation. While not dangerous in permanent insanity, it is exceedingly so in temporary or recurrent insanity. Basedow's disease was formally considered a contra-indication to general anaethesia. Crile (Annals of Surgery, June, 1908)) shows conclusively that the bad result formerly experienced after thyroidectomy was due to the psychic phenomena resulting from the fear of operation, and not to the anaesthetic per se. He secures the patient's consent to operate, but does not set a date. Volatile oil is administered on a cone for a few days, the patient assuming that she is receiving inhalation treatment. On the morning of the operation the pseudo-treatment is begun, but ether is soon substituted and the patient anaesthetized without her knowledge. On the evening before operation bromides are administered, and on the morning of operation morphia gr. ¼ is given.

Choice of anaesthetics: Ether is to be preferred to chloroform in cardiac disease, prolonged anaesthesia, hemorrhage, where frequent temporary removal of the anaesthetic is necessary, and in all conditions where the patient's vitality is exhausted.

Chloroform is only preferable to ether in severe bronchial diseases, high arterial tension and atheroma. I believe I can administer ether with more safety than chloroform to a patient with pulmonary diseases.

The role which chloroform plays in obstetrical work has probably been as much misunderstood as Oschsner's treatment of appendicitis. It is to be preferred to obtund the pain in delivering the foetal head, but if we consider carefully the post-anaesthetic effects upon the liver and other viesera we readily see that toxemia is more liable to ensue after its prolonged administration than after ether. I have given ether many times for obstetrical operations, and certainly prefer it in all cases where manipulations are to be of any length.

DANGER SIGNALS, ETC.

Rapidly dilating pupils is dangerous, but a fixed dilated pupil is extremely so. A contracted immoble pupil is safe, while an oscillating pupil or nystagmus signify diminishing anaesthesia. Ashen hue is due to asphyxiation, and pallor to the gradual poisoning of the circulation, including the medullary centers. A very rapid or disappearing pulse is indicative of too much anaesthesia or shock. Cessation of respiration may be due to resistance, too profound narcosis, falling of the epiglottis or tongue, or gauze in the abdomen.

PROPHYLACTIC TREATMENT OF EMERGENCIES.

Examine the patient thoroughly and select the proper anaesthetic. In emergencies wash out the stomach; in set cases empty the bowels thoroughly and give last enema at least six hours prior to operation. A cup of tea or coffee, with or without brandy, may now be given and the patient allowed to remain undisturbed. Rest is valuable, so do not continually irritate the patient on the morning of operation. If they are fond of reading or some game encourage them to indulge in this pastime. By all means gain their confidence and speak a word of encouragement while they are going under the anaesthetic. Let them breathe through the dry cone for a few minutes, then begin the anaesthetic slowly; do not give enough at the start to produce coughing. Where a great amount of abdominal pressure is to be relieved or hemorrhage is anticipated it is well to begin saline intra-venously or subcutaneously sychronously with the operation. (Fort) The hemorrhage, however, must be controlled before the saline is begun. Prevent suffocation by allowing the secretion to drain out and keeping the epiglottis open and the tongue forward by the Heiburg-Esmarch grip. This, however, is not to be practiced during vomiting, as the vomitus may be aspirated into the lung resulting in pneumonia. Large nerve trunks should be cocanized before they are severed. If ligation of the carotids or dilation of the sphincter is practiced withdraw the anaesthetic. Always protect the abdominal contents with hot towels.

Actual treatment of emergencies: Cardiac and respiratory failures are treated by artificial respiration, oxygen inhalation, position, stimulation, cardiac massage, dilation of the sphincter and the insertion of ice into the rectum and the removal of gauze packs from the abdominal cavity. Do not incline a patient with a large abdominal tumor or ascites. Oschsner has called attention to the fact that if inspiration is produced first, the excess of anaesthetic is drawn deeper into the lungs; therefore produce expiration first. I have found rhythmical pressure with the hand or elbow over the lower end of the sternum a most excellent method of artificial respiration. Do not attempt over eighteen or twenty respirations per minute, and never given up in despair until you are forced to. Patients have ben resuscitated after one hour of labor. If the tongue is withdrawn be careful not to lacerate it on the lower incisors.

Administration. Ether: In this series of cases I have administered ether with the Allis and Clover inhalers, by the nitrous oxide ether sequence, and by ethyl chloride as a preliminary to ether. On several occasions I gave scopolamine gr. 1-150, morphia sulph. gr. 1-6 to 1-8 as an adjunct, but anaesthesia was either too profound or the patient had an idiosyncracy to the scopolamine and became exceedingly restless. The results were too variable and dangerous to recommend it.

At present I have discarded all but the open drop method, because the struggling is practically eliminated, the patients are anaesthetized more rapidly (average six minutes) and I think it by far the safer way of administering the anaesthetic. One-half hour before anaesthesia is begun morphia gr. ¼ and atropia gr. 1-150 to 1-100 are given. The morphia produces a calmness and not so much of the anaesthetic is necessary to produce narcosis. The atropia not only prevents the secretion of mucus in the throat but stimulates the patient and allays fear. I am sure that a mentally and physically depressed patient does not take an anaesthetic as well as the one stimulated just to the point of good feeling.

Since I began using the open method I have had to stop the operation but once, and then in a case of ruptured ectopic gestation with active hemorrhage. The abdomen was opened, the bleeding controlled, and saline was given subcutaneously. The patient reacted and the operation was completed. I rarely ever look at the pupil or count the pulse. If the respiration is rhythmic I know my patient is all right. He is sufficiently anaesthetized if he is kept between a snore and a sigh. Just as an experienced machinist can detect a break in his machinery by a change in the sound it makes, so can an experienced anaesthetist tell the degree of narcosis by the rhythm of his patient's respiration.

Chloroform: My experience with chloroform is limited to the open method, and I must acknowledge that I am afraid of it. I do not think it should ever be used except when there is a great contra-indication to ether.

A. C. E. mixture: In the beginning of my career I was compelled to use A. C. E. mixture, but have abandoned its use. It may have been my inexperience or it may have been the anaesthetic, nevertheles it gave me great experience in resuscitation, for nearly all my patients did badly.

Ethyl chloride: I have given ethyl chloride by the open and closed methods, and consider it a safe and valuable anaesthetic in short operations. If the open method is to be used the tongue of the spray must be broken and the anaesthetic allowed to drop on an Esmarch inhaler.

Nitrous oxide: Nitrous oxide may be given with air or oxygen for operations lasting an hour or more. It is the safest of all anaesthetics, both primarily and secondarily, and I consider it the anaesthetic of choice in all operations where the patient is in extremes.